LFU04 – SOP Examination of Latent Print Evidence

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1. Scope

1.1. This standard operating procedure utilizes the ACE-V (Analysis, Comparison, Evaluation, and Verification) methodology, which is used to examine latent fingerprint evidence. The methodology employs guidelines and procedures which have been devised by, promulgated by, and sanctioned by a shared consensus of the discipline's practitioners. This methodology assures that results are obtained in a harmonized, objective and reliable manner.

2. Background

2.1. To set forth the practices for documenting the examination of evidence to conform to the requirements of the Department of Forensic Sciences (DFS) Forensic Science Laboratory (FSL) Quality Assurance Manual, the accreditation standards under ISO/IEC 17025:2005, and the supplemental standards set by the FSL's accrediting body.

2.2. A majority of this process is taken directly from the SWGFAST Standard for the Documentation of Analysis, Comparison, Evaluation, and Verification (ACE-V) (Latent), ver. 1.0, published 2/12/2010.

3. Safety

3.1. Not applicable

4. Materials Required

4.1. Schedule of Analysis (if applicable)

4.2. Latent worksheets/case notes

5. Standards and Controls

5.1. Not applicable

6. Calibration

6.1. Not applicable

7. Procedures

7.1. When friction ridge detail is examined using the ACE-V methodology, examiners' documentation shall be such that another qualified examiner can determine what was done and interpret the data.

7.2. Documentation

7.2.1. Shall be made at or near the time of the examination and may be in the form of annotated images, narratives, worksheets, annotated legible copies, sketches, photocopies, AFIS or electronic records, or any combination of these methods.

7.2.2. Documentation will be a part of the case record including copies of digital latent prints and/or physical latent lifts and/or copies of printed photographs. Refer to *LOM02 – Practices of Case Documentation and Report Writing* for information regarding hard copy or electronic administrative and technical records typically found in a case file.

7.2.2.1. All original latent fingerprint evidence is stored in a separate secure room in the LFU.

7.2.3. Although all examinations require documentation, the extent of the documentation is related to the type of case (decedent case versus latent print case) and complexity of the examination. The friction ridge impression alone is not sufficient documentation. The impression and/or a legible copy will be annotated and have accompanying notes.

7.2.3.1. It is understood that not all information may be available to the examiner. When information is available, the relevant information will be noted.

7.2.4. For the purposes of this procedure "latent print" refers to a questioned friction ridge impression and "known print" refers to exemplars of friction ridge skin. Additionally, the procedure refers to the documentation of ACE-V on preserved latent prints (e.g., latent prints recovered on a lift or in a photograph).

7.2.5. Each area of apparent friction ridge on a latent lift card, digital image, or photo, must be noted and given a designation of value or no value.

7.2.5.1. Only latent impressions that are deemed of value will be itemized.

7.2.6. Analysts will analyze all latents in a case unless otherwise noted in the case documentation. Even when an AFIS "hit" is attained or a manual identification is made, the analyst will ensure all additional latents of value in the case are compared to this individual.

7.3. Analysis

7.3.1. The analyst will assess the latent or unknown print to determine if there is sufficient clarity to establish levels of detail available for comparison. Individual analysts' tolerance and determinations of sufficiency depend on previous training, experience and understanding.

7.3.2. Many factors can affect the appearance of friction ridges and therefore the qualitative/quantitative aspects considered in all phases of the ACE-V methodology.

7.3.2.1. The following can affect the quality and clarity of friction ridge impressions and will be used while assessing the print:

7.3.2.1.1. Substrate influences – porous/non-porous, rough / smooth

7.3.2.1.2. Deposition pressure – slippage, twisting

7.3.2.1.3. Elasticity of the skin

7.3.2.1.4. Matrix/Residue reactions – blood, oil, grease, dirt

7.3.2.1.5. Reagent/Residue reactions – development medium

7.3.2.1.6. Condition of the friction skin – creases and scars

7.3.3. Analysis documentation of a latent print will be completed prior to comparison. The quality and quantity of the information present in the latent print will dictate the extent of the documentation. At a minimum, for any latent impressions deemed to be of value, the following shall be documented in the case record:

7.3.3.1. Anatomical source (e.g., fingerprint, palmprint), if known/can be determined

7.3.3.1.1. At a minimum the anatomical orientation should be documented on the latent lift card or image to denote the correct direction of the print, when known/can be determined

7.3.3.2. Presence of level 1 detail

7.3.3.3. Presence of level 2 detail

7.3.4. Latent prints that are found to be of no value will have limited documentation; however, at a minimum they will be designated no value on the latent lift card/image.

7.3.5. The analysis of latent prints may also include documentation of additional factors such as matrix, deposition pressure, lateral movement, rotational movement, level 3 detail, or other friction ridge skin detail (e.g., creases, scars). The inclusion of this information is at the analyst's discretion.

7.3.6. Copies of Latent Evidence

7.3.6.1. Many submitted cases contain duplicates or copies, in the form of multiple photos or photos of lifts, of latent print evidence. It is at the analyst's discretion to decide which version has the highest quality and will be used for analysis and possible comparison.

7.4. Comparison and Evaluation

7.4.1. When comparing latent prints of value, analysts will perform a side-by-side comparison of the latent print with the known prints to determine if the details and minutiae in the two prints are in agreement or disagreement based on similarity, sequence and spatial relationship. Analysts will use all levels of detail (as applicable) when performing comparisons.

7.4.1.1. Creases, scars and other distortions can be used to individualize or exclude latent prints.

7.4.2. After the analyst performs the comparison and makes a tentative conclusion, they will move on to the evaluation phase where they will make a final determination as to whether the detail between the known and unknown latent print are in complete agreement.

7.4.2.1. Because no print is ever perfectly replicated, mental comparative measurements must be within acceptable tolerance for variations and/or distortions. This tolerance must be enough to ensure that the analyst has complete assurance that the replication is accurate.

7.4.3. Documentation that records the information relied upon by the case examiner during evaluation, will be made for each identification in the case record. Documentation of the comparison relies on both the latent print and known print.

7.4.3.1. Case examiner conclusions will be documented prior to submitting the evidence for verification.

7.4.3.2. Known prints printed from the AFIS database are considered examination documentation. These prints are not considered evidence and will therefore not be itemized or documented in the Chain of Custody.

7.4.3.3. A legible copy of the known prints used for comparisons (regardless of the result (identification, exclusion, or determined to be inconclusive) will be retained in the case file.

7.4.4. Identification

When comparison results in an identification, at a minimum, the following information will be documented by the case examiner in the case file:

7.4.4.1. Unique identifier of the exemplar such as name, date of birth, assigned identification number (PDID), or reference to the specific exemplars (e.g., date of arrest, date of recording)

7.4.4.2. The specific latent impression number

7.4.4.3. The specific anatomical source (finger or palm) the identification was made to, along with the left or right side

7.4.4.4. Initials, signature, or equivalent (e.g., unique identifier, electronic signature) of examiner

7.4.4.5. Date conclusion reached

7.4.4.6. The source record for the identification conclusion. Documentation regarding the exclusion of additional known person(s) is not required following a conclusion of identification for each single impression by the case examiner. In the event additional known persons are not compared, the case notes must reflect the same.

7.4.4.7. The laboratory will include the ultimate conclusion for each impression, as determined by the examiner. If an impression has been identified, only the identifying information will be listed. Latent impressions resulting in a conclusion of exclusion and/or inconclusive will require all known persons to be included in the report.

7.4.5. Exclusion

If latent prints are not identified to the known prints and the person can confidently be excluded as being the source of the latent prints, the following information will be documented by the case examiner in the case file:

7.4.5.1. Specific latent friction ridge impression examined

7.4.5.2. Unique identifier(s) of the exemplar(s) used to reach the conclusion

7.4.5.3. Initials, signature, or equivalent (e.g., unique identifier, electronic signature) of examiner

7.4.5.4. Date conclusion reached

7.4.6. Inconclusive

7.4.6.1. This result type can be used in the following two situations:

7.4.6.1.1. Known prints that are deemed insufficient for comparison, or that contain any factors that adversely affect the comparison, will be appropriately documented by the case examiner in the case file. The quality and quantity of the information present will dictate the extent of the documentation.

7.4.6.1.2. Complex friction ridge impressions that are of value, but a result of identification or exclusion cannot be reached after comparison.

7.4.6.2. At a minimum the documentation should include:

7.4.6.2.1. Specific latent friction ridge impression examined

7.4.6.2.2. Unique identifier(s) of the exemplar(s) used to reach the conclusion

7.4.6.2.3. Specific anatomical source, if applicable (e.g., right thumb, left hypothenar)

7.4.6.2.4. Reason the known prints are insufficient for comparison, if applicable

7.4.6.2.5. If applicable, factors that may have contributed to the inability to reach a definitive conclusion. These factors can include:

7.4.6.2.5.1. Substrate interference

7.4.6.2.5.2. Possible distortion

7.4.6.2.5.3. Quality of latent lift or photo

7.4.6.2.5.4. Unexplainable discrepancies

7.4.6.2.6. Initials, signature, or equivalent (e.g., unique identifier, electronic signature) of examiner

7.4.6.2.7. Date conclusion reached

7.4.7. If re-analysis of the latent print during the comparison results in new information, supplemental notes will be added and dated.

7.4.7.1. If the analyst changes the “of value” decision, this will be documented. The reason for changing the “of value” decision will also be documented. Any conclusions reached up to the point the analyst changes the “of value” decision will be documented.

7.5. Verification

7.5.1. All identifications will be verified by a second analyst.

7.5.2. Cases where all latents are determined to be no value will be verified by a second analyst.

7.5.3. At a minimum, all conclusions in 10% of each analyst's cases will be verified on a monthly basis.

7.5.3.1. All conclusions in the case include the following conclusions that were not previously verified; all latents deemed of value and no value, all exclusions, and all inconclusive results.

7.5.4. Certain technical errors found during verification, such as erroneous exclusions and erroneous identifications, will be reported by the original analyst or verifier to the LFU Manager, Lead Scientist and/or Technical Leader. This information and their resolution will be documented and monitored to determine frequency and impact, and to identify possible training or quality issues.

7.5.5. Verifications will be documented in the case file and include:

7.5.5.1. Specific latent friction ridge impression examined

7.5.5.2. Unique identifier of the exemplar(s) used to reach the conclusion, when applicable

7.5.5.3. Anatomical source, when applicable

7.5.5.4. Conclusion of the verifying examiner

7.5.5.5. Initials, signature, or equivalent (e.g., unique identifier, electronic signature) of the verifying examiner

7.5.5.6. Date of verification

7.5.6. When the following information is available to the verifier, he or she will not have to separately document:

7.5.6.1. The specific latent friction ridge impression examined

7.5.6.2. The unique identifier of the exemplar(s), when applicable

7.5.6.3. The anatomical source, when applicable

7.5.6.4. The conclusion

7.6. Consultations

7.6.1. Consultation is an interaction between examiners regarding one or more impressions in question.

7.6.1.1. If examiners have interaction on a particular print, the consulted examiner will not be used as the verifier for that particular print.

7.6.2. Consultations that are deemed significant may be documented in the case file and include:

7.6.2.1. Specific friction ridge impression(s) reviewed

7.6.2.2. Nature and result of the consultation (e.g., reviewed identification)

7.6.2.3. Initials, signature, or equivalent (e.g., unique identifier, electronic signature) of examiner(s)

7.6.2.4. Date of consultation

7.7. Conflict Resolution

7.7.1. Occasionally, issues may arise between the analyst and reviewer and/or verifier in results obtained or the conclusions drawn.

7.7.1.1. Verifier and Analyst will discuss the basis of the disagreement(s) and try to resolve the matter. If resolved, no further review is necessary, however 7.5.4 still must be followed.

7.7.1.2. A disagreement that cannot be resolved will be considered a conflict and should be reported to the LFU Manager, Lead Scientist and/or Technical Leader.

7.7.1.2.1. Consensus judgement may be sought.

7.7.1.2.1.1. The case may be reassigned to the verifier if the new results can be verified by another analyst, LFU Supervisor or Technical Leader.

7.7.1.2.1.2. The original results will be maintained if it can be verified by another analyst, LFU Supervisor or Technical Leader.

7.7.1.2.2. An independent examination, peer review and/or blind testing by additional examiners may be conducted.

7.7.1.3. All case documentation including original and any new case notes must be included in the case jacket. The analyst may cross-out, initial and date the pages with the original documentation and a communication log may be added to describe the change that occurred.

8. Sampling

8.1. Not Applicable

9. Calculations

9.1. Not Applicable

10. Uncertainty of Measurement

10.1. Not Applicable

11. Limitations

11.1. The following factors affect the qualitative and quantitative aspects of friction ridge impressions. A competent examiner will understand these factors, recognize that they occur in friction ridge impressions, and understand how they influence friction ridge impression reproducibility. These factors may cause an apparent dissimilarity between impressions from the same source. Failure to properly assess the occurrence and influence of these factors could result in misinterpretation. When applicable, the following factors must be considered in all steps of the ACE-V methodology:

11.1.1. Anatomical aspects including the condition of the skin (e.g., scars and warts) and the morphology of the hand and foot relative to the shape and contour of the substrate.

11.1.2. Transfer conditions including pressure applied during transfer, slippage, or twisting, sequence of deposition (i.e., double taps and overlays) and an understanding of the limitations of friction ridge pliability.

11.1.3. Transfer media including bodily secretions and contaminants (e.g., sweat, blood, paint, dirt, oil, grease).

11.1.4. Detection techniques that can include one or more of the following: optical (i.e., light sources and illumination techniques), physical, or chemical processing techniques.

11.1.5. Recording or preservation techniques, such as photography, lifting live-scan, and ink.

11.1.6. Substrate (e.g., porous, non-porous, semi-porous, smooth, rough, corrugated, pliable, or textured surfaces).

11.1.7. Environmental conditions (e.g. protected, unprotected, wet, dry, cold or hot).

12. Documentation

12.1. LFU worksheets and/or notations on latent lift cards/images

12.2. LFU Report of Examination

13. References

13.1. *SWGFAST Standard for the Documentation of Analysis, Comparison, Evaluation, and Verification (ACE-V) (Latent)* 2/12/10 ver. 1.0

13.2. *SWGFAST Standard for Examining Friction Ridge Impressions and Resulting Conclusions* 09/13/11 ver. 1.0

13.3. *The National Institute of Justice Fingerprint Sourcebook* (Current Version)

13.4. *SWGFAST*, Glossary, 5/8/09, ver. 2.0

13.5. *Forensic Science Laboratory Quality Assurance Manual* (Current Version)

13.6. *DFS Departmental Operations Manuals* (Current Versions)

13.7. *FSL Laboratory Operations Manuals* (Current Versions)